

IN THE CLAIMS

The current claims for this application are listed below.

1. (Currently Amended) An apparatus for depositing functional blocks into a substrate comprising:

A mobile relocating tool having a first plurality of receptor sites for depositing ~~having~~ a plurality of functional blocks ~~deposited~~ therein, wherein at least one of said receptor sites is a recessed region within said relocating tool, the recessed region designed to closely fit at least a portion of a single functional block;

a fluid assembly environment for depositing said functional blocks into the first plurality of receptor sites;

a moving mechanism coupled to the relocating tool to move the relocating tool from the a fluidic assembly environment to another environment; and

a transfer tool having a plurality of nozzles which are positioned relative to each other so that the plurality of nozzles are in alignment with said first plurality of receptor sites, said transfer tool being able to remove said plurality of functional blocks from said relocating tool and deposit said plurality of functional blocks into a second plurality of receptor sites in said substrate.

2. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 further comprising a vibration device coupling to said transfer tool to agitate said transfer tool as said plurality of functional blocks are being deposited into said second plurality of receptor sites.

3. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 further comprising an adhesive dispensing device to dispense adhesive into said second

plurality of receptor sites in said substrate before said plurality of functional blocks are deposited into said second plurality of receptor sites.

4. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 further comprising a micro liquid dispensing device to dispense droplets of fluid over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites.

5. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 further comprising an adhesive dispensing device and a micro liquid dispensing device, said adhesive device to dispense adhesive into said second plurality of receptor sites in said substrate and said micro liquid dispensing device to dispense droplets of fluid over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites.

6. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein said second plurality of receptor sites being configured to mate with said plurality of functional blocks.

7. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 6 wherein said plurality of receptor sites and said plurality of functional blocks have any one of a trapezoidal shape, a rectangular shape, a square shape, and a cylindrical shape

8. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 6 wherein said plurality of functional blocks has an asymmetrical shape and said plurality of receptor sites are configured to match said asymmetrical shape.

9. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein said transfer tool is further coupled to a vacuum source conveying vacuum to said plurality of nozzles.
10. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein all of said first plurality of receptor sites have same dimensions and shapes.
11. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein said first plurality of receptor sites comprises of different size and shape receptor sites.
12. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein said plurality of nozzles has a dimension that is smaller than a dimension of said plurality of functional blocks.
13. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 1 wherein said plurality of functional blocks are deposited in said relocating tool by an FSA device using a slurry to deposit said plurality of functional blocks into said plurality of receptor sites.
14. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 13 further comprising a drying device.
15. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 13 further comprising a curing device.

16. (Currently Amended) An apparatus for depositing functional blocks into a substrate comprising:

A mobile relocating tool having a first plurality of receptor sites for depositing ~~having~~ a plurality of functional blocks ~~deposited~~ therein, said plurality of functional blocks further comprises circuitry components, wherein at least one of said receptor sites is a recessed region within said relocating tool, the recessed region designed to closely fit at least a portion of a single functional block;

a fluid assembly environment for depositing said functional blocks into the first plurality of receptor sites;

a moving mechanism coupled to the relocating tool to move the relocating tool from a fluidic assembly environment to another environment; ~~and~~

a transfer tool having a plurality of nozzles, said transfer tool being able to remove said plurality of functional blocks from said relocating tool and deposit said plurality of functional blocks into said substrate wherein said substrate is made out of a thermoset material; and ~~wherein~~

a means for heating said substrate to a high enough temperature so that is not when said plurality of functional blocks are being deposited the functional blocks become embedded in the thermoset material.

17. (Currently Amended) An apparatus for depositing functional blocks into a substrate as in claim 16, wherein the means for heating further comprising a heating device capable of heating said substrate to above a softening point.

18. (Previously Presented) An apparatus for depositing functional blocks into a substrate as in claim 17 further comprising a curing device to cure said substrate.

19. (Currently Amended) An apparatus for transferring functional blocks comprising:
a fluid assembly environment for depositing said functional blocks into a plurality of receptor sites in a first substrate;
a transfer tool having a plurality of nozzles, said transfer tool to remove a plurality of functional blocks deposited on the ~~formed on~~ a first substrate from said first substrate;
a transfer station to invert said plurality of functional blocks; and
wherein said transfer tool to pick up inverted functional blocks and deposit said inverted functional blocks onto a second substrate having a plurality of receptor sites, wherein at least one of said receptor sites is a recessed region within said relocating tool, the recessed region designed to closely fit at least a portion of a single functional block.
20. (Previously presented) An apparatus for transferring functional blocks as in claim 19 further comprising a second transfer tool having a second plurality of nozzles wherein said second transfer tool is used to pick up said inverted functional blocks and deposit said inverted functional blocks onto said second substrate having said plurality of receptor sites.
21. (Previously Presented) An apparatus for transferring functional blocks as in claim 19 wherein said plurality of receptor sites has a matching pattern with said plurality of nozzles on said transfer tool.
22. (Previously Presented) An apparatus for transferring functional blocks as in claim 20 wherein said plurality of receptor sites has a matching pattern with said another plurality of nozzles on said another transfer tool.

23. (Currently Amended) An apparatus for transferring functional blocks comprising:
a fluid assembly environment for depositing said functional blocks into a plurality of
receptor sites in a first substrate;
a transfer tool having a plurality of nozzles, said transfer tool to remove a plurality of
functional blocks deposited on the ~~formed on a~~ first substrate and to transfer said
plurality of functional blocks from said first substrate to a top side of a functional
layer, wherein a carrier is detachably coupled to a bottom side of the functional
layer;
a substrate forming station to form a second substrate over said plurality of functional
blocks transferred to said top side of the functional layer; and
a detachment station for detaching said carrier from said functional layer.
24. (Canceled)
25. (Previously Presented) An apparatus for transferring functional blocks as in claim 23
wherein said functional layer is a photopatternable layer.
26. (Previously Presented) An apparatus for transferring functional blocks as in claim 25
further comprising a pattern vias forming station for forming contact vias created in said bottom
side of the photopatternable layer for electrical interconnections to said plurality of blocks, after
the carrier has been detached.
27. (Previously Presented) An apparatus as in claim 26 wherein said functional layer is a
photoresist film.

28. (Currently Amended) An apparatus for transferring functional blocks comprising:
A mobile relocating tool having a first plurality of receptor sites for depositing ~~having~~ a plurality of functional blocks ~~deposited~~ therein, wherein at least one of said receptor sites is a recessed region within said relocating tool, the recessed region designed to closely fit at least a portion of a single functional block;
a fluid assembly environment for depositing said functional blocks into the first plurality of receptor sites;
a moving mechanism coupled to the relocating tool to move the relocating tool from the a fluidic assembly environment to another environment; and
a transfer tool coupling to an adhesive layer; said transfer tool to transfer said plurality of functional blocks from said relocating tool to a substrate wherein said plurality of functional blocks adhere to said adhesive layer, wherein the transfer tool comprises a plurality of attachment sites positioned relative to each other that comprises the same relative positions as the plurality of receptor sites in the relocating tool, and the same relative positions as deposition sites on the substrate upon which a plurality of functional blocks are to be deposited.
29. (Previously Presented) An apparatus as in claim 28, further comprising:
a vacuum source coupling to said transfer tool, said vacuum source adheres said adhesive layer to said transfer tool.

Claims 30 - 47(Canceled).

48. (Withdrawn) A method of depositing functional blocks into a substrate comprising:
forming a plurality of functional blocks on a first substrate, said plurality of functional blocks further comprises circuitry components;

removing said plurality of functional blocks from said first substrate using a transfer tool
having a plurality of nozzles;
inverting said plurality of functional blocks; and
transferring said plurality of functional blocks that are inverted to a second substrate.

49. (Withdrawn) A method of depositing functional blocks into a substrate as in claim 48 wherein said substrate comprises a plurality of receptor sites aligning with said plurality of nozzles and wherein said transferring of said plurality of functional blocks that are inverted includes depositing one of said plurality of functional blocks into one of said second plurality of receptor sites.

50. (Withdrawn) A method of depositing functional blocks into a substrate as in claim 48 wherein said substrate is made out of a thermoplastic or thermoset material and wherein said method further comprising:

heating said substrate to above a softening limit of said material to soften said substrate
prior to said transferring of said plurality of functional blocks into said substrate.

51. (Withdrawn) A method of depositing functional blocks into a substrate as in claim 48 wherein said inverting said plurality of functional blocks comprises:

picking up said plurality of functional blocks that are inverted using another transfer tool.

52. (Withdrawn) A method of depositing functional blocks into a substrate comprising:

forming a plurality of functional blocks on a first substrate, said plurality of functional
blocks further comprises circuitry components;

removing said plurality of functional blocks from said first substrate using a transfer tool
having a plurality of nozzles;

transferring said plurality of functional blocks to a photopatternable layer deposited on a carrier;
forming a second substrate over said plurality of functional blocks deposited on said photopatternable layer; and
removing said carrier to expose said photopatternable layer.

53. (Withdrawn) A method of depositing functional blocks into a substrate as in claim 52 further comprising creating contact vias in said photopatternable layer for electrical interconnections to said plurality of blocks.